3.0 AFFECTED ENVIRONMENT

3.1 GEOGRAPHY AND TOPOGRAPHY

The proposed project is located within the Imperial Valley in Imperial County. Imperial County is located in the extreme southeastern portion of California. It is bordered by San Diego County on the west, the Colorado River and Arizona on the east, Riverside County on the north, and Mexico on the south. Imperial Valley, also known as the Salton Sink, Salton Basin, or Salton Trough, is an extension of the Gulf of California but cut off from the ocean by the Colorado River's delta fan. In geologic history, it was an inland sea. The elevation of the valley ranges from 14.3 m (47 feet) above sea level at the high point of the Colorado River Delta in Mexico to -83.8 m (–275 feet) below sea level near the Riverside County line. The average elevation in the project area is 27 m (88.6 feet) below sea level.

The central portion of Imperial Valley is primarily irrigated cropland and contains several small cities. This area is surrounded by natural desert. The valley area is a broad, flat, alluvial plain that slopes down gradually toward the north. The Salton Sea, the largest lake in California, lies at the bottom of the sink.

Over the millennia, the Colorado River would occasionally escape and drain into the Salton Sink, partially filling it. In 1901, the California Development Company began diverting Colorado River water down into the valley for irrigation. During a flood, the Colorado River broke through the half-finished headgate for the channel. Soon afterward, nearly the entire river was flowing into the Salton Sink via the New and Alamo Rivers. It took nearly two years to completely repair this breach which caused the formation of the Salton Sea. Since then the Salton Sea has been replenished by the New and Alamo Rivers, which had been converted into drain channels. Today the level of the Salton Sea is sustained by the inflow of municipal, industrial, and agricultural drainage from the Imperial and Mexicali Valleys.

The New River lies within the project study area and must be crossed by all alternatives. The river is located with a narrow channel that meanders through a large, steep banked channel in the valley floor. Within the large channel are a series of agricultural fields, drains, access roads and the Brawley Sewage Treatment Plant.

The Alamo River flows from Mexico into the Salton Sea, and lies approximately 4.8 km (3 miles) from the proposed project. It is not affected by drainage from the project area, and is not crossed by any of the alternatives.

3.2 LAND USE AND GROWTH

3.2.1 Existing Land Use and Area Description

This proposed project is located primarily within the unincorporated area of Imperial County with a small portion on one alternative within the city of Brawley and all alternatives adjacent to the City's Sphere of Influence. The city of Brawley may serve as a relocation area for residents displaced by the project. Figures 3-1(A-M) depict selected existing land uses along the project corridor. These aerials are presented from the project end to the project beginning.

Imperial County

Imperial County covers nearly 1,214,057 ha (3,000,000 acres) with about 50% of the land undeveloped and under federal jurisdiction. The project is located in the central portion of Imperial County, which is within the Imperial Valley. The Imperial Valley is renowned as one of the prime winter vegetable crop growing areas in the nation with approximately 202,343 ha (500,000 acres) of irrigated crop land. The Valley's fertile soil and desert climate allows farmers to cultivate year round. Its large agricultural output is also due in part to its geographic proximity to the major urban centers of Los Angeles, San Diego, and Mexicali. Less than 1% of the land in the county is developed for urban uses.

In 1901, irrigated water from the Colorado River was brought to the Imperial Valley. By 1907, when Imperial County separated from San Diego County, nearly 15,000 settlers had moved to the Imperial Valley and started producing vegetables, field crops and livestock. The Imperial Irrigation District, a public company, was formed in 1911 and subsequently purchased the water and power distribution networks in the Valley. As of January 1, 1999, there were 142,737 people living in Imperial County. The county hosts seven cities and eight unincorporated area communities. The cities account for about 75 % of the population and, historically, have grown at a faster rate than the unincorporated area. The three largest cities are El Centro (pop. 37,955), Calexico (pop. 26,131), and Brawley (pop. 21,662). The city of Mexicali, located immediately south of the border in Mexico, is home to approximately 700,000 people and has a strong effect on the economy of Imperial County.

The existing zoning in the project area within the unincorporated portion of Imperial County is generally agricultural with a 16.2 ha (40 acre) minimum lot size. The exceptions are the Luckey Ranch Specific Plan Area (please refer to Section 3.2.2), which allows an agricultural interim use, scattered small lots with homes adjacent to agricultural fields, and smaller agricultural parcels in the vicinity of Best Road, the New River, and SR-111.

There is an equestrian facility/home located on Best Road and a feedlot located on Shank Road near the Del Rio Alignment(s). A Future Farmers of America (FFA) pig barn is located near the Fredricks Alternative south of the New River crossing. The Del Rio Country Club would be close to both the Del Rio and Fredricks Alternatives. Even though the public is allowed to use the county club facilities at a fee higher than those paid by the members, it is a private, member owned golf course and country club. Approximately 120 members collectively share ownership. Although currently within the unincorporated county, the Del Rio Country Club serves as an important focal point for the residents of Brawley. In addition to golf activities, local residents use the golf course facilities for meetings and other social occasions such as weddings. The sewage treatment facility for the city of Brawley would be close to the Del Rio and Del Rio North Alternatives. These land use improvements are shown on Figure 3-1 D, Figure 3-1 E, Figure 3-1 I and Figure 3-1 J. Imperial Irrigation District canals and drains are located throughout the project area and are shown on Figure 3-2.

Brawley

Brawley, with a population of 21,662, was incorporated in 1908. The city originally served as a family community for the farmers and cattlemen working in the area and, due to its location on the rail line, a trading and shipping center. The city continues to provide retail and professional

services to northern Imperial County and hosts the annual Cattle Call Sale and Rodeo in November. Brawley is located in the center of the Imperial Valley at -36.3 m (-119 feet) below sea level. State highways 111, 86, and 78 all intersect in Brawley. Mexico's border is 40.2 km (25 miles) to the south and San Diego is 193 km (120 miles) to the west.

State Route 78 currently traverses the downtown portion of Brawley. This section of Brawley was originally laid out with a wide central corridor for dust control. Therefore, the Civic Center square and downtown shopping district retained their historic character as the town modernized. Pedestrian use in the downtown area is high. School children pass across State Route 78 en route to school or to local businesses such as Foster's Freeze, located on the north corner of the square. Please refer to Figure 3-3A, Figure 3-3B and Figure 3-3C for photos depicting downtown Brawley.

Brawley is a full service community as shown on Figure 3-4. It serves both as an employment center for local services, industry, and agricultural and a bedroom community for jobs located farther south in the cities of Imperial and El Centro. It hosts the Brawley Elementary School District, with four elementary schools and a junior high school, the Brawley Union High School District, with two schools, and the Sacred Heart Catholic Church School.

The Fredricks Alternative bisects the industrial area at the far northern portion of the existing Brawley City limits along existing State Route 111 and Shank Road. Several of these industries have direct access to the railroad. Please refer to Figure 3-1E, Figure 3-3D, and Section 3.4 for additional information about the businesses. The majority of these businesses are providers of agricultural services to the farming community. On the north side of Shank Road are the Jacobson Warehouse, Big Valley Packers, and the Benson Onion processing facility. There is a caretaker residence on-site at both the Benson Onion and Jacobson Warehouse facilities. The Imperial Grain Growers, a farmer's cooperative with about 60 active members, and La Bolsa, Inc., a construction firm specializing in farm drainage systems, are located on the south side of Shank Road. Two additional properties with access to Shank Road are located south of Imperial Grain Growers and along State Route 111. The Lesicka property houses five businesses and the Southwest Marketing property leases to El Toro Export (ETX), a large grain processor.

Calexico

The city of Calexico is located immediately north of the International Border and the City of Mexicali. The 111 begins at the US port of entry and continues north through the city of Calexico. Calexico thrives on cross border shopping from Mexicali realizing over 3 million dollars annually in sales and use taxes. There are many goods and services available in Calexico that are not available in Mexicali. Calexico is the only city on the border with Mexico that has California Enterprise Zone status. The Enterprise Zone boundary encompasses much of the City's commercial and industrial land.

Westmorland

The city of Westmorland is a small city located just to the north and west of the project's western terminus on State Route 78/86. Incorporated in 1934, it has a population of 1,712. State Route 78/86 traverses the downtown portion of the city of Westmorland as a four lane conventional highway. Primarily a bedroom community, Westmorland has one school for grades K through 8

and offers limited services to local residents and highway oriented traffic. Industry in Westmorland is largely based on agriculture.

Mexicali

Similar to the Imperial Valley, Mexicali is a large agricultural center and the principal agricultural area in the State of Baja California, Mexico. Thus, the initial growth that occurred in this area was primarily dependent on irrigation projects. The entire area depends on the Colorado River for its agricultural irrigation needs as well as industrial and urban uses. The region's major agricultural products are grains, livestock feed, vegetables and cotton. The city of Mexicali was founded in 1903 by the Pacific Land Company and is the capital of the State of Baja California. Its northern boundary parallels the international border along Imperial County. The central business district (CBD) of Mexicali is immediately adjacent to the city of Calexico, California. The Mexicali population, which has increased from 601,938 in 1990 to 696,034 in 1995, represents 33% of the population of the State of Baja California. The municipality had the smallest growth rate of all in the state with only 2.6% for the 1990-95 period. The City has diversified and its manufacturing and industrial base has grown. In 1994, Mexicali had 123 maquiladora (twin plant) factories employing 20,368 people.

The Calexico/Mexicali area now has two border crossings, which handle pedestrian and passenger vehicle crossings. The Calexico border crossing accounted for 28.8 million northbound pedestrian crossings or about 31% of the total for the California-Baja California border in the fiscal year 1995. The number of northbound commercial vehicle crossings was 176,420 during fiscal year 1995. When the new border crossing, Calexico East-Nuevo Mexicali (located about 9.7 km [6 miles] east of the original border crossing), opened on December 2, 1996, all commercial vehicle traffic was diverted there.

The Imperial County, CA - Mexicali, B.C. region is connected to the industrial and consumption centers of both the United States and Mexico through existing highway facilities. Interstate 8 connects the area with San Diego to the west and Arizona to the east while SR-86 and SR-111 connect to Interstate 10 and on to the Los Angeles Metropolitan area to the northwest. As seen on Figure 1-4, MX-2 provides connections to Tijuana to the west and the State of Sonora and the Mexican interior to the southeast. To the south, MX-5 connects the area to San Felipe on the Gulf of California. Rail connections provide a direct freight link to Los Angeles, Arizona and Mexico City and passenger service only to Mexico City. The area is connected by air with two small airports at Mexicali, B.C. and Imperial, CA, as well as other smaller airports at San Felipe, B.C. and Calexico, CA.

Although located in the neighboring Mexican State of Sonora, San Luis Río Colorado, across the border from San Luis, Arizona, is growing as part of the sphere of influence of Tijuana and Mexicali. The 130,000-plus city is enjoying some of the spill over business in TV, computer monitor and VCR manufacturing from Korean companies with large plants in Baja California. Daewoo, for example, produced 770,000 TV's, 1.5 million VCR's and 600,000 computer monitors in 1997. This company's goals include capturing 10% of the U.S. market by the year 2000, meaning the production of 3.3 million TV's, 2.27 million VCR's and 2 million computer monitors and 6 million components.

Together with northern Baja California, the San Luis Río Colorado area generated the highest number of jobs in all of Mexico during the first six months of 1996, with over 25,000 jobs created in the region. Although the closest border crossing is San Luis, AZ, the truck traffic generated would impact California highways when these products are shipped to the West Coast.

3.2.2 Planned Land Use

Imperial County General Plan

The majority of the project is located within the unincorporated area of Imperial County and therefore is subject to the Imperial County General Plan for land use planning. The Land Use Element of the Imperial County General Plan guides the physical growth of the county and the public facilities necessary to support the growth. Specific plans are used within designated areas of the county to implement large developments and their necessary infrastructure and public services. The county has nine designated Specific Plan Areas within its unincorporated area. Figure 3-5 depicts the General Plan's proposed land use map. The proposed land use is primarily agricultural with the exception of the "Luckey Ranch" Specific Plan located at the eastern end of the project.

The Circulation and Scenic Highways Element of the County General Plan identifies the transportation infrastructure necessary to support the projected land use and travel patterns within the County. The proposed project is shown in the Circulation Element in Figure 3-6. Since the approval of the Imperial County General Plan in 1993, Caltrans has worked with the County staff and the Board of Supervisors to study several expressway alternatives to serve transportation needs on this corridor. The Circulation Element Goals and Objectives of Imperial County are consistent with the goals of the proposed project. These shared goals include:

- Ensuring safe and coordinated traffic patterns, contiguous growth, and planned and consistent development around city/township areas.
- Promoting efficient intra- and inter-County travel with minimal disruption to existing and planned communities.
- Creating special crossings for farm equipment, if necessary, at busy agricultural roads.
- Providing the facility and level of access necessary to serve the specific existing and proposed land uses.
- Coordinating with adjacent communities and agencies to provide the maximum compatibility of adopted circulation elements and regional facility plans.

The Imperial County General Plan also contains an Agricultural Element. The Agricultural Element was adopted with the intention of promoting and managing agriculture ensuring compatibility between land uses and providing clear guidelines for decisions in agricultural areas. Further, the County adopted a "Right to Farm Ordinance" in 1990 to further protect agricultural operations. The Goals and Objectives of the Agricultural Element generally support the preservation of agricultural land and directing development to less valuable farmland when the conversion is justified.

City of Brawley General Plan

The SR-78/111 Brawley Bypass is shown on the 1995 Brawley General Plan on the Del Rio Alternative alignment. However, in March of 1998, the Brawley City Council took a position in favor of studying the Fredricks Alternative for the expressway. To date, the General Plan has not been changed to reflect the Fredricks Alternative except by default within the Luckey Ranch Specific Plan Area. The 1995 Circulation Element shows existing SR-111, SR-86, SR-78, Shank Road, Best Road (discontinuous at the airport), Mead Road and Malan Street as major arterials. The Brawley General Plan Planned Land Use is shown on Figure 3-7. The Planning Area Boundary shown on Figure 3-7 is the Sphere of Influence for the city. Proposed land uses along the project alternatives are primarily industrial or light industrial/business park, or commercial with smaller areas proposed for agricultural, public facility and residential. The corridor along the New River is proposed for open space but, with the exception of the Sewage Treatment Plant, is privately owned near the project alternatives.

1998 Final Draft Brawley Municipal Airport Master Plan

The 1998 Final Draft Brawley Municipal Airport Master Plan addresses the proposed expansion of the airport's runway in order to meet future operational and current Federal Aviation Administration (FFA) safety requirements. Figure 3-8 shows the proposed runway and Runway Protection Zone (RPZ). A Final Master Plan for the airport is expected to be approved by March 2001.

Luckey Ranch Specific Plan

The proposed Luckey Ranch development is a 786 ha (1,942 acre) master-planned community that includes industrial, light industrial/business park, commercial and residential areas. The project was recently downscaled to include only the 235 ha (580 acres) within the City of Brawley's Sphere of Influence in active planning. The 1998 Draft Luckey Ranch Specific Plan states that its planning has been designed to accommodate both the proposed expansion of the Brawley Municipal Airport and the SR-78/111 Brawley Bypass. Of the 235 ha (580 acres) currently proposed, 59 ha (146 acres) are single family residential, 16 ha (39 acres) are multi-family residential, 18.6 ha (46 acres) are commercial, 75 ha (185) acres are light industrial/business park, 40.5 ha (100 acres) are industrial, 2 ha (5 acres) are school, 9 ha (22 acres) are community parks, and 15 ha (37 acres) are included in the airport planning area. These are shown on Figure 3-8, Figure 3-9 and Figure 3-10. Figures 3-9 and 3-10 are directly from the Draft Luckey Ranch Specific Plan and show their proposed land uses and arterial street network in conjunction with the proposed Fredricks and Del Rio SR-78/111 Brawley Bypass Alternatives. Please note that the location of the Fredricks Alternative is different on Figures 3-8 and 3-9. The Final Luckey Ranch Specific Plan was approved July 18, 2000 for the Fredricks Alternative Land Use Plan only.

3.2.3 Growth

Although a relatively small number of people live in Imperial County, it experienced rapid growth in the 1990's during, a slow period of growth in the State of California. The population increased from 109,303 people in 1990 to 141,555 people in 1995 (nearly a 30% increase). Population growth slowed in 1998, as shown on Table 3-1, but this may be a short-lived anomaly

due to the strong economy and job growth in the nearby San Diego region. The city of Brawley has experienced slow adsorption of commercial and industrial land but is actively pursuing new industry. It has experienced moderate growth of residential land, mostly in the southwestern portion of town.

TABLE 3 - 1

Imperial County Population Trends April 1990 to January 1999

	1990	1995	1999
City of Brawley Population	18,923	21,004	21,662
City of Westmorland Population	1,380	1,603	1,712
Imperial County Population	109,303	135,468	142,737

However, the ratification of the North American Free Trade Agreement in 1993 is expected to generate substantial trade growth. The Port of Entry is a primary access point for distribution between California and Mexico. Trade between California and Mexico amounted to $11.34 billion in 1992. California Office of Planning and Research projections indicate that total exports from California to Mexico will increase by 85 % and imports from Mexico to California will increase by 46 % between 1990 and 2015. Table 3-2, below, shows the population, housing and employment forecasts for Imperial County. As shown on Table 3-2, the county's population and household stock will approximately double between 1995 and 2020. The county's employment is expected to grow by over 70% between 1994 and 2020. The employment trends in Imperial County are volatile. However, the projections indicate increases in nonagricultural wages and salaries with local agricultural jobs remaining consistent with their present seasonal trends.

As discussed in the land use section, there is a large specific plan area, known as the Luckey Ranch, at the eastern end of the project. All land use development is subject to the national economic trends and tends to occur at a more rapid rate when the national economic outlook is favorable. Thus, the phrase "long term" could be as little as ten years or over 20 years. The portion of Luckey Ranch in active planning was recently downscaled from 786 ha (1,942 acres) to 235 ha (580 acres). Due to the current slow down in population growth and competing industrial/business projects in Imperial County, growth is likely to be slow in the short term despite the robust economy.

Although agricultural impacts will be discussed in greater detail in the next section, it is important to discuss the sensitivity of agricultural growth impacts in this section. The American Farmland Trust has identified Imperial County as one of the top 20 threatened Major Land Resource Areas (MLRA's) in the nation. This ranking was established to identify high quality farmland threatened with development. The top 20 MLRAs represent only 7 % of the nation's land, excluding Alaska and Hawaii, but account for 21 % of the nation's prime or unique farmland lost to urban development. These 20 MLRAs are responsible for 51 % of the nation's fruit production, 39 % of vegetable production, and 28 % of dairy production. Fruit and vegetable production areas, in particular, are rapidly losing land to urban development. Between 1982 and 1992, 7689 ha (19,000 acres) of land in Imperial County were converted to urban uses. Approximately 3238 ha (8,000 acres) of the converted land were classified as Prime Farmland.

This indicates that growth impacts to agricultural land in Imperial County are important on a national scale.

TABLE 3 - 2

Imperial County Population Housing and Employment Forecasts 1990 to 2020

	1990	2000	2010	2020
City of Brawley Population	18,923	22,586	27,294	33,187
City of Westmorland Pop.	1,380	1,702	2,254	2,944
Imperial County Population	109,303	148,980	207,305	280,341
City of Brawley Households	5,791	6,829	8,472	10,779
City of Westmorland Households	408	502	662	889
Imperial County Households	32,842	42,888	60,230	84,560
City of Brawley Employment	8,454	10,244	11,732	13,465
City of Westmorland Emp.	303	431	509	601
Imperial County Employment	46,118	62,197	74,992	89,880

Source: SCAG Forecast Adopted April 1998

3.3 FARMLAND

As previously discussed, Imperial County contains one of the most productive agricultural areas in the nation, particularly for winter vegetables. The Imperial County General Plan states that "agriculture has been the single most important economic activity of Imperial County throughout the 1900s, and is expected to play a major economic role in the foreseeable future." Although very supportive of agriculture policies, Imperial County does not participate in the State of California Williamson Act.

About 28% of the valley is cultivated. It produces many types of agricultural products including vegetables, sugar beets, hay crops, small grains, citrus, dates, grapes, dairy and livestock. The valley is well known for its midwinter salad vegetables. Harvest begins in December and continues through March. The spring production of warm-season vegetables starts in late April and includes sweet corn, melons, and onions. Field crops are harvested several times annually and livestock production continues year round. Annual crop values for 1995 include over $475,000,000 for vegetable and melon crops, nearly $270,000,000 for field crops (primarily hay and grasses), over $200,000,000 in livestock production, over $30,000,000 in fruit crops and $25,000,000 in seed and nursery production. In 1998, the total agricultural output in Imperial Valley was $1.083 billion. Sale of feedlot cattle led Imperial County's dollar value for a single commodity at $151,408,000. Further, state agricultural officials indicated that the cattle feedlot industry may expand substantially in Imperial County in the near future. Wheat, consistently in the Imperial Valley's top ten crops, was listed as number 10 in 1998 with sales of $40,830,000.

Soils within the Imperial Valley consist of very fertile alluvial deposits from the Colorado River floodplain. Generally, the soils in this area require irrigation to receive classification as Important Farmland. Further, most of the fields have tile drains to reduce their alkalinity and ground water levels. Soils in the project corridor fall into either the Prime or Statewide Important Farmland classifications. Prime Farmland is land with the best combination of physical and chemical characteristics for the production of crops. Statewide Important Farmland is land with a good combination of physical and chemical characteristics for growing crops. The location of the Prime and Statewide Important Farmland in the project corridor is shown on Figure 3-11.

Although both types of classifications are excellent, Prime Farmland is superior in dollar value, crop yields and values, and in its ability to sustain a greater variety of crops (which allows greater market responsiveness). Prime Farmland also supports more rotations per season, is less alkaline, and its water holding capacity is more conducive to growing crops. Statewide Important Farmland is generally a heavier soil type requiring more maintenance, more ripping and more leaching. The type of crops grown on Statewide Important Farmland are also limited to those compatible with the heavier soils. As of 1990, there were 186,819 ha (214,534 acres) of Prime Farmland and 128,592 ha (317,757 acres) of Statewide Important Farmland in Imperial County.

The expected effects of NAFTA on the Valley's agricultural output include an increased market for some products and increased competition for others. Agricultural commodities expected to improve for the County's growers include meat and dairy products, wheat, cotton, sweet corn, green beans, rice, tomato paste and frozen asparagus. Increases in exports from Mexico are expected in the form of melons, fresh tomatoes, bell peppers, cucumbers, broccoli, and asparagus. It is expected that Imperial County can remain competitive with Mexico in vegetable production if the imported products are required to meet California State minimum quality standards.

In the project corridor, the primary types of crops grown are either vegetable/melon or hay field crops. Alfalfa has often been the second highest dollar product in the county and is used to support locally raised livestock. All of the fields are irrigated as part of the comprehensive Imperial Irrigation District (IID) gravity flow network of canals and drains. Generally the flow is from south to north and each field's system connects into the IID system. The agricultural operations and IID system utilize public roads and a system of access roads on private property. It is quite common to see farm equipment on the local roads and, to a lesser extent, on state highways in Imperial County.

3.4 SOCIAL AND ECONOMIC

Housing in the project area is located largely within the unincorporated area of Imperial County and widely dispersed. The city of Brawley provides the closest community services. The project area is within the Brawley Elementary School District and the Brawley Union High School District. The nature of the rural housing is such that poor to moderate income householders are sometimes immediately adjacent or close to middle or high income householders. The County also has a very high percentage of persons living below the poverty level, 23.8% according to the 1990 census. The poverty level as defined by standards set by the Department of Health and Human Services (HHS). For the year 2000, the HHS definition of low

income is $17,050 for a family of four. The census data also indicate that 66% of the county's residents are Hispanic and that housing values and incomes are lower than the statewide average. The income factors indicate that the county is economically depressed despite an average annual agricultural crop valuation over 1 billion dollars. Demographic data for the project area is shown in Table 3-3 with the corresponding census boundaries shown on Figure 3-12.

Agriculture, and its related industries, dominates the county's economic base. Agriculture is also the largest employer with approximately 35% of the work force. Personal income from agricultural and related jobs was $231,400,000 with 25,829 jobs in 1998. The agricultural harvests create a large number of seasonal jobs as well as year round employment. Federal, State, and Local government provide employment for over 20% of the work force and retail trade accounts for about 15%. Historically, Imperial County has one of the highest levels of unemployment in the state, at 24.7% in 1990 and 26.5% in 1997. This compares to an overall rate of 5.8%for California in 1990 and 6.3% in 1997. In spite of the high unemployment rate, the agricultural job force appears to be supplemented by about 11,000 workers from Mexico each year. The construction, trade, and agricultural sectors of employment all show historic trends of volatility in Imperial County. Government constitutes a high percentage of the nonagricultural employment sector and industry a low percentage.

As previously mentioned in the Growth section, international border trade is expected to increase the nonagricultural employment sector. Other programs, such as the Enterprise Zone in Calexico, will also strengthen nonagricultural employment. Current Caltrans traffic projections indicate that the truck crossings at the Port of Entry east of Calexico will increase substantially by the year 2020. The support industries for the trade increase are expected to have a strong beneficial impact to the overall economic environment in Imperial County.

A majority of businesses in the immediate vicinity of the Fredricks Alternative (see Figure 3-1E) are critical to the support of the local region's agricultural industry. They also provide needed jobs to the residents of Brawley, many of whom are minorities. The seasonal jobs provide supplemental income that many families depend upon (see Figure 3-3 D). The Jacobson Warehouse is a 20,000 square foot warehouse used for the storage, handling and distribution of agricultural chemicals. Commercial carrier ships the chemicals to destinations throughout the Imperial Valley. The Benson Onion packing plant is a seasonal operation open from mid-April to early June. The plant is also capable of processing melons. Thirty to forty employees work during the peak season, six days a week. Big Valley Packers, a vegetable packing plant, operates during the winter and spring with a peak season from May 1 to mid-June. During the winter, they employ about 15 people, in early spring about 50, and as many as 200 people during the peak harvest period. They have annual sales of approximately $10,000,000. Imperial Grain Growers, Inc. (IGG) is a farmer owned and operated cooperative with 110 members, 60 of whom are active members. It has been in business for 77 years and at its present location for 22 years. IGG provides the seed, fertilizer, marketing and handling of wheat for its members. Imperial Grain Growers brings in its primary fertilizer, anhydrous ammonia (NH3), largely by rail and sometimes by common carrier. The NH3 is then transferred to smaller trucks and trailers for distribution to the agricultural fields. Annually, IGG brings in 6,000 to 8,000 tons of NH3 and 5,000 to 6,000 tons of dry fertilizer. On site, they have two 18,000 gallon and one 15,000 gallon NH3 storage tanks. Annually, they process over $8,000,000 worth (41,000 tons) of Durhum wheat. The growers for the co-op raise Durhum wheat and harvest in May and June which is the first U.S. harvest. Durhum wheat typically sells for 40 to 70 % more than red wheat, the

TABLE 3 - 3

1990 CENSUS SELECTED POPULATION AND HOUSING CHARACTERISTICS

Characteristic	Imperial County	City of Brawley*	City of Westmorland*	Block Group 102.004	Block Group 103.001	Block Group 103.002
# Persons	109303	19001	1505	176	640	511
% White	67.3%	73%	80%	90%	82%	69%
% Black	2.4%	2%	2%	0%	0.2%	0%
% Amer. Ind, Esk. Alas	1.7%	1%	1%	0%	0%	0%
% Asian, Pacific Islander	2.0%	1%	1%	3%	0.2%	2%
% Other Race	26.6%	23%	17%	6%	18%	29%
% Total Hispanic**	65.8%	69%	71%	45%	47%	47%
% Over 65 Years Old	10.2%	8%	10%	5%	17%	4%
Median Household Income	$22,442	$25,692	$21,716	$33,472	$34,038	$31,979
% Below Poverty Level	23.8%	24%	21%	9%	13%	13%
Total Housing Units	36559	6133	475	61	232	147
Vacant Housing Units	3717	333	24	4	26	3
Owner Occupied SFR	14232	2612	212	10	73	49
Renter Occupied SFR	5109	1058	115	21	58	26
Multi Family Units	12241	1816	118	0	12	5
Owner Occupied MH	3908	201	24	26	39	47
Renter Occupied MH	1069	113	6	0	24	17
% Same House in 1985	43%	48%	50%	64%	62%	60%
Median Value 1989	$72,500	$83,133	$60,600	$112,500	$116,700	$92,300
Median Rent 1989	$313	$419	$302	N/A	$340	$347

* City of Brawley data is compiled from Census Tracts 104.00, 105.00, 106.00 and 107.00. City of Westmorland data is compiled from Census Block Groups 102.002 and 102.003

******The concept of race as used by the Bureau of the Census reflects self-identification. It does not denote any clear-cut definition of biological stock. The data for race represents self-classification by people according to the race with which they most closely identify. The question of Hispanic origin was asked independently of the question concerning race. A person of Hispanic origin may be of any race.

most common wheat. It is used primarily for pasta. Currently they can store 23,000 tons of wheat on site in two large storage buildings. The grain is shipped out on rail cars or by common carrier when rail cars are not available. Imperial Grain Growers employs 8 people year-round adding two or three workers during wheat season (mid-May to mid-July).

La Bolsa Inc., located at the southeast corner of Shank Road and State Route 111, is a construction firm that currently specializes in farm drainage systems. Construction equipment is currently repaired, fueled and stored on site. The Lesicka Trust property, located immediately south of La Bolsa, Inc. on State Route 111, has five tenants. First is Lesicka Construction, Inc. which currently has its offices, shop and equipment storage on site. Gold Cross Ambulance Service shares a building with Lesicka Construction, Inc. The building contains sleeping quarters, cooking facilities, and a TV room to serve the ambulance crews on duty. Several ambulances are stored on site and the business serves the city of Brawley. Custom Body & Paint Shop occupies another building on the site and performs repair work on farm equipment and automobiles. G & W Tractor Repair specializes in the repair of Caterpillar equipment, tractors and farm machinery. They also operate a part sales business on site. They have been located on

the Lesicka Trust property for 22 years and the repair shop is customized to meet the needs for repairing large and heavy equipment. Dan Williams Seed Company occupies the fourth structure on the Lesicka Trust property. They sell vegetable seeds to local farmers and receive delivery by common carrier. Customers may pick up their seed on site or have it delivered to their fields.

El Toro Export (ETX) leases the property immediately south of Imperial Grain Growers. They are a major grain storage facility handling approximately 25% of the grain grown in the Imperial Valley. ETX also sells Durham wheat with annual tonnage at 50,000 and a commodity value of approximately $10,000,000. Their seed products are distributed locally and to the entire desert southwest. During the peak grain season, ETX employs 12 people, full time, on site. ETX and Imperial Grain Growers both utilize the adjacent railroad spur since rail shipping is approximately 2/3's the cost of common carrier transport.

The Jerge School of Horsemanship and Triangle Feeders are located in the immediate vicinity of both the Del Rio and Del Rio North Alternatives. The Jerge School of Horsemanship is located on a 4 ha (10 acre) parcel with a modular home on site. The equestrian facility contains four exercise/riding arenas ranging in size from a 150' X 300' riding arena to a 60' lunging area, a twenty stall breezeway barn, four covered pens and three uncovered pens, and six tackrooms. About twenty horses are on site and others trailer in for special events. Triangle Feeders is a 50-acre facility with offices, feed, manure and equipment storage, various outbuildings and cattle pens on site.

Traffic and Circulation

SR-78 originates at Interstate 5 in San Diego County and terminates at Interstate 10 (I-10) in Riverside County near the Arizona border. The segment of SR-78 in Imperial County joins SR-86, west of Westmorland, and continues as one route southeasterly to the city of Brawley. In Brawley, SR-86 turns southerly to cities of Imperial and El Centro, while SR-78 continues northeasterly to Riverside County. In the Imperial Valley, SR-78 is primarily a rural two-lane conventional highway. In the city of Brawley, SR-78 is a four-lane arterial.

SR-86 originates near the U.S./Mexico international border just north of Calexico. It traverses Imperial County through the cities of El Centro, Imperial and Brawley before extending up the west side of the Salton Sea to connect with I-10 in Riverside County. Most of SR-86 has been upgraded to a four-lane expressway.

SR-111 originates at the U.S./Mexico international border in Calexico and traverses northerly and roughly parallel to SR-86. SR-111 intersects SR-78 at the eastern city limits of Brawley, and is discontinuous. Near the center of Brawley, SR-111 continues northerly from SR-78. The route traverses the eastern side of the Salton Sea and through the Coachella Valley in Riverside County and terminates at I-10. SR-111 is mostly a two-lane conventional highway, except between SR-98 and I-8 where it is a four-lane expressway.

3.5 BIOLOGICAL RESOURCES

The biological review for this project comprised of the following: a California Natural Diversity Database (CNDDB) and California Department of Fish and Game (CDFG, 1998) search; a review of Skinner and Pavlik (1994) for records of sensitive plants in the vicinity of the project;

and a review of biological reports of projects in adjacent areas (Department of Transportation 1998, 1997a, 1997b, 1997c, 1994a, 1994b). Wetland delineations were performed in the areas of the proposed New River crossing for each alternative and are contained in a separate report (Tierra, 1997). A list of endangered and threatened species was provided by the U.S. Fish and Wildlife Service (USFWS); (see Appendix A).

Biological surveys were conducted for all alternatives to identify the presence of any sensitive habitat, species of concern, and wetlands within the project limits. Emphasis was placed on plant and animal species listed by state and federal agencies as threatened or endangered. Judgements about potential fauna within the project area were based on known range and habitat preferences of the species. In addition, surveys were conducted following USFWS Survey Protocol (U.S. Department of the Interior 1997) for the southwestern willow flycatcher (*Empidonax traillii extimus*) and mountain plover (*Charadrius montanus*). Survey information is listed in Table 3-1. A letter was received from the United States Fish and Wildlife Service (USFWS) dated July 16, 1998, listing the federally endangered, threatened, proposed, and candidate species that may be present in the project area (Appendix A). Revisions to the species list will be requested from the USFWS as the process of project evaluation/review continues. Please refer to Figure 3-13A, Figure 3-13B and Figure 3-13C for approximate locations of species occurrence.

3.5.1 Wetlands/Waters of the U.S.

The term “wetlands” means those areas that are inundated or saturated by surface or ground ACOE waters at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps marshes, bogs, and similar areas.

New River Crossings

Figure 3-13A, Figure 3-13B and Figure 3-13C show the jurisdictional habitats for the project alternatives. The U.S. Army Corps of Engineers (ACOE) has jurisdiction over wetlands and waters of the US. The jurisdictional habitat occurring at the river crossings are: ACOE-waters of the US, ACOE wetland dominated by salt cedar; ACOE wetland dominated by iodine bush, and CDFG regulated salt cedar dominated woodland.

Fredricks Alternative

The floodplain in this area supports a diverse habitat (see Figure 3-13A). Although it is dominated by salt cedar, it also has areas of alkaline playas dominated by iodine bush and transitional salt cedar-big salt bush habitat. There are no agricultural activities currently being conducted in this area of the floodplain.

Del Rio Alternative

This area supports a less diverse habitat due to adjacent land uses and because the river is narrow and confined by steep banks (see Figure 3-13B). Within the floodplain, the project is located between an agricultural area and a sewage treatment facility in salt cedar dominated woodland.

Del Rio North Alternative

In the area of the crossing, the river abuts cliffs and agricultural land with only a narrow band of salt cedar along the river (see Figure 3-13C).

Agriculture Drains and Canals

The Imperial Irrigation District (IID) operates the agricultural canals and drains throughout the project area. The drains are unlined, but are maintained and contain little to no vegetation. Existing man-made irrigation canals and drains are exempted from the COE's regulations under Section 404 of the Clean Water Act (See the ACOE's letter dated July 29, 1999, in Appendix J). Therefore, agricultural drains are not considered jurisdictional by the ACOE.

The majority of the drains and canals impacted by each of the project alternatives are perpendicular to the proposed alternative and would be piped under the new highway. There are also several drains and canals that run parallel to the existing roadway and will need to be relocated. These include: 400 m (1,312 ft) of Marsh Drain for Del Rio North Alternative; 400 m (1,312 ft) of Marsh Drain and 400 m (1,312 ft) of Livesley Drain for Del Rio Alternative; and 760 m (2,493 ft) of Spruce Drain No.2 for Fredricks Alternative. Only a portion of an unnamed drain contains substantial wetland vegetation. This drain is located just north of the cattle stockyards on Shank Road.

3.5.2 Habitat

Agriculture

The majority of the project area consists of agricultural fields. Agricultural weeds dominate those areas without crops. The farmhouse yards contain a variety of trees such as eucalyptus (*Eucalyptus* sp.) and date palms (*Phoenix dactylifera*) which are non-native, imported species. These trees provide nesting and roosting areas for many birds and possibly bat species.

Salt Cedar Woodland

This habitat consists of a monoculture of salt cedar, which usually replaces native vegetation following a major disturbance. Salt cedar woodland is the dominant plant community along the banks and within the 100-year Floodplain of the New River.

Alkali Playas

Alkali playas consist of low areas adjacent to the New River with moist soils encrusted with salt. Iodine bush is typically the dominant vegetation. The Fredricks Alternative would have several areas of alkali playa in the vicinity of the New River crossing. These areas are referred to as iodine bush dominated wetland for (ACOE) jurisdiction.

Wildlife Corridors/Habitat Linkages

The desert riparian habitat along the New River provides an important north-south corridor for many riparian, wetland, and upland species, both locally and regionally (i.e. from the Salton Sea

to south of the U.S.-Mexican border). Although the vegetation along this river is dominated by salt cedar, it constitutes a unique ecosystem in the Imperial Valley providing habitat for many different kinds of wildlife. As a long, narrow habitat strip within a landscape dominated by agricultural fields, the function of the New River as a movement corridor is highly susceptible to the effects of fragmentation, especially for non-flying species.

The function of the New River as a corridor for terrestrial animals has been greatly reduced due to extensive agricultural activities in the 100-year Floodplain and the 21 bridges that cross the river between U.S.-Mexican border and the Salton Sea. These bridges are typically very short and low and do not provide opportunity for movement. An average bridge over the New River includes a concrete box culvert bridge that is 14 m (46 ft) wide and only 49 m (160 ft) long with no bare ground. Animals must either swim through the culvert or cross the divided highway. Numerous animals, including raccoons and coyotes, have been killed crossing the highway in this area.

The habitat along the New River provides roosting and foraging habitat for many resident and migratory birds. Areas within the 100-year Floodplain that are broad and support native vegetation, such as the Fredricks Road Alternative, are especially important for birds that roost in colonies (i.e. egrets, herons and ibis).

3.5.3 Wildlife

Plants

Forty-two species of plants were observed within the project limits during biological surveys. The low number of species reflects the relatively small amount of area that is not cultivated or developed, and the disturbed condition of the remnant vegetation communities. An estimated 76 percent of the plants documented in the field were non-native species. Based on the existing land uses, and the condition of the non-crop areas (i.e., dominated by agricultural weeds), it is reasonable to assume that with construction, exotic plants will either be introduced into the project area from adjoining parcels or, as a direct result of surface-disturbing activities, the on-site, non-native seedbank may be triggered/activated. The Biological Resource Report provides a list of both the sensitive and exotic flora observed within the project limits.

There were no sensitive plants on the species list provided by the USFWS. The CNDDB database records search included Thurber's pilostyles (*Pilostyles thurberi*). No plant species of concern were found, nor would they be expected based on the disturbed nature of the area and the lack of suitable habitat.

Fauna

Seventy-nine species of animals were identified within the project area during biological surveys. These include: one amphibian; three species of reptiles; seventy-one species of birds; four species of mammals; and six species of invertebrates. The most common species observed within the project area were; mourning dove (*Zenaida macroura*), song sparrow (*Melospiza melodia*), white-crowned sparrow (*Zonotrichia leucophrys*), killdeer (*Charadrius vociferus*), red-winged blackbird, white-faced ibis (*Plegadis chihi*), ring-billed gull (*Larus delawarensis*), and

alfalfa butterflies (*Colias eurythem).* The Biological Resource Report provides a sensitive faunal species list of the project area. The Finney-Ramer Unit of the Imperial Wildlife Area is located along the Alamo River, approximately 11 miles south of Niland. Managed by the California Department of Fish and Game, the 2,047-acre site offers fishing and hunting opportunities to the general public.

Listed and Sensitive Species

Considering the level of disturbance to the natural environment and the limited availability of wetlands, many of the species listed would not be expected to occur in the project limits. The Biological Resource Report lists sensitive species considered during this assessment that would not be expected to occur in the project limits because suitable habitat does not occur.
There were no sensitive plants on the species list provided by the USFWS. The CNDDB database records search included Thurber's pilostyles (*Pilostyles thurberi*). No plant species of concern were found, nor would they be expected to occur based on the disturbed nature of the area and the lack of suitable habitat. A list of potential plant species of concern can be found in the Biological Resource Report.

Wildlife

Sensitive animals include those listed or proposed listed by the USFWS and CDFG; and those considered sensitive by the CDFG. Results from the California Natural Diversity Database (CNDDB) search (CDFG 1997) added the yellow warbler (*Dendroica petechia brewsteri*), short-eared owl (*Asio flammeus*) and crissal thrasher (*Toxostoma crissale*) to the list of potential species of concern for the project area.

During surveys conducted for the proposed project the following ten sensitive faunal species were observed: Yuma clapper rail (*Rallus longirostris yumanensis*); southwestern willow flycatcher (*Empidonax trailli extimus*); mountain plover (*Charadrius montanus*); northern harrier (*Circus cyaneus*); burrowing owl (*Athene cunicularia*); long-billed curlew (*Numenius americanus*); white-faced ibis (*Plegadis chihi*); mountain plover (*Charadrius montanus*); great blue heron (*Ardea herodias*); great egret (*Casmerodius albus*); loggerhead shrike (*Lanius ludovicianus*); and yellow warbler (*Dendroica petechia brewsteri*). In addition to the sensitive faunal species observed, five additional sensitive species, the desert pupfish (*Cyprinodon macularis*), brown pelican (*Pelecanus occidentalis*), least Bell's vireo (*Vireo bellii psillus*), peregrine falcon (*Falco peregrinus*), were identified by the USFWS as potentially occurring within the project area. Each of these species and their status within the project area is included in the discussion below.

Burrowing Owl (Athene cunicularia)
Listing: Sensitive by USFWS and CDFG Species of Special Concern

Burrowing owls are typically restricted to grasslands and agricultural lands. Most of these areas have been converted to urban uses and are no longer suitable burrowing owl habitat. Their distribution includes lower British Columbia to Manitoba, Canada and the central and western United States south to northern Mexico and Baja California. They use burrows of the California ground squirrel (*Spermophilus beecheyi*) or the round-tailed ground squirrel for cover and nest sites.

Burrowing owl populations are declining due to habitat loss, incidental poisoning and destruction of their burrows during eradication campaigns aimed at rodent colonies, illegal shooting, road kill, human disturbance, and the introduction of non-native predators and artificial enhancement of certain native predator populations.

There were fourteen sightings of burrowing owls during surveys of the project study area. Most of the surveys of the project area coincided with the egg-incubation period of this species. The female is entirely responsible for the incubation process, remaining in the burrow while the male defends the nesting territory and brings food to the female. As such, "solitary" individuals observed in the study area were likely males, paired with females that were probably present in burrows at the time of the surveys. Therefore, "solitary" were considered as pairs.

The owls forage within the agricultural fields and native vegetation, typically in the vicinity of their burrow(s). During the surveys, burrows were observed along roads and the raised berms of the irrigation canals and drains and at the top of cliffs boarding the New River 100-year Floodplain. No burrows were observed in agricultural fields. Because of this, the burrows and nesting territories are tightly packed alongside the roads and berms where there is limited ground disturbance and burrows can persist. Within the project limits, all berms bordering agricultural fields, drainages and canals and cliff areas are either occupied or present potential burrow habitat. All the agricultural fields and drainages within the project area are considered potential foraging habitat for this species.

Yuma clapper rail (Rallus longirostris yumanensis)
Listing: Federal Endangered, State Threatened

The clapper rail is a resident of shallow, freshwater or brackish stream-sides and marshlands, associated with heavy riparian and swamp vegetation containing dense stands of cattails, bulrushes bisected by channels of flowing water. They are largely restricted to the Lower Colorado River Valley, from the Laguna Dam to Yuma. In addition, they are also found in marshes at the southeastern end of the Salton Sea. Population trends are unknown but are suspected to be downward due to loss of marshes along the lower Colorado River. Known breeding sites in the Imperial Valley include West Pond, Imperial National Wildlife Refuge, and the Salton Sea. They are almost completely silent during the winter; crayfish are the majority of their diet. The Yuma clapper rail is threatened by loss of habitat due to human-caused river flooding, mosquito abatement activities, dredging, channelization, and stabilization of banks by riprapping. High levels of selenium may also be a threat.

CNDDB (CDFG 1998) reports a sighting of these birds outside of the project limits, at Ramer and Finney Lakes, the Holtville Main Drain and along the Alamo River south of the Salton Sea. One clapper rail was heard vocalizing during wetland delineation fieldwork on June 4, 1997, at the western boundary of the Fredricks Alternative on the northern bank of the New River. The vegetation in this area includes salt cedar, common reed and big saltbush with no areas of cattails or bulrushes within or immediately adjacent to the project limits. This is not optimal habitat for the clapper rail, which typically nests in freshwater marsh. Because of the lack of typical clapper habitat and the time of year, this bird may have been a dispersing juvenile. On August 28, 1998 two clapper rails were identified along the New River approximately 900 m (2953 ft) southwest of the Fredricks Alternative. In this area of the 100-year Floodplain, which is outside of the proposed project limits, there are areas of freshwater marsh containing dense stands of cattails,

bisected by channels of flowing water adjacent to the New River. No clapper rails were detected within the project limits and none are expected due to lack of appropriate habitat.

Southwestern willow flycatcher (Empidonax trailli extimus)
Listing: Federal and State Endangered

The breeding range of this bird includes southern California, southern Nevada, southern Utah, Arizona, New Mexico, western Texas, southwestern Colorado, and extreme northwestern Mexico. Within this region, the subspecies is restricted to riparian habitats along rivers, streams, or other wetlands, where dense growths of willows, *Baccharis*, arrow weed, tamarisk, Russian olive or other plants are present, with a scattered overstory of cottonwood. Throughout the range of the flycatcher, these riparian habitats tend to be rare, widely separated, small and/or linear locales, separated by a vast expanse of arid lands. The southwestern willow flycatcher nests in thickets of trees and shrubs approximately 4-7 meters in height, with dense foliage above ground, and a high canopy cover. Following modern changes in riparian plant communities, this flycatcher has been known to nest in thickets dominated by tamarisk and Russian olive. Habitats not selected for nesting are narrower riparian zones, with greater distances between willow patches and individual willow plants. The southwestern willow flycatcher has experienced extensive loss and modification of its habitat and is also endangered by other factors, including brood parasitism by the brown-headed cowbird.

One to two southwestern willow flycatchers were observed within the 100-year Floodplain of the New River near the Del Rio Alternative. Surveys were conducted following USFWS Survey Protocol. This survey protocol requires a minimum of three surveys, one performed during each of these periods; 15-31 May; 1-21 June and 22 June - 10 July, to document absence of willow flycatchers. Three surveys were performed within the riparian habitat of the New River for each alternative. Willow flycatchers were observed foraging adjacent to a small tributary of the New River during the first survey conducted (18 May 1999). No breeding behavior, such as nest building was observed. The flycatchers were not present during the two subsequent survey periods, thus indicating according to the USFWS Protocol (1997), that these flycatchers are probable migrants. In addition, many other migratory species were observed in this area during the first survey and not during last two surveys. Although southwestern willow flycatchers occur as migrants it is unlikely that the project will effect breeding birds or nesting habitat.

Northern harrier (Circus cyaneus)
Listing: CDFG Species of Special Concern

This species breeds from northern Alaska and Canada to northern Mexico. It winters from southern Canada to South America. The northern harrier's typical habitat consists of grasslands, marshes, prairies, desert scrub and agricultural fields. The harrier typically feeds on a wide variety of animals. They are generally seen flying close to the ground over grassland, agricultural fields, and coastal marshes. Northern harriers are a common migrant and winter visitor, but are rare in the summer in Imperial County.

Two individuals of this species were observed foraging over agricultural fields within the project limits of the Del Rio and Del Rio North Alternatives. All agricultural fields and drains are considered potential foraging habitat.

Long-billed curlew (Numenius americanus)
Listing: CDFG Species of Special Concern

This species breeds in southwestern Canada and the western United States, and winters south through Mexico to Honduras and Costa Rica. They are also found along the eastern coast of Florida in winter. Habitat preferences include: prairies, grassy meadows, tidal mudflats, and salt marshes; they are consistently found near water. In California, this species is common in the Imperial and Central Valleys where there are abundant fields and grasslands. Fewer are found in coastal regions.

Growing concern began in the early 1980's with the curlew's placement on local lists of concern. Decline is likely due to habitat loss and degradation but may also be attributed to organochlorine poisoning (similar to DDT). Recent use of organophosphates in agriculture has many of the same toxic effects despite the fact that they take less time to break down.

Several long-billed curlews were observed adjacent to the project limits in irrigated agricultural fields. All agricultural fields and drains are considered potential foraging habitat.

White-faced ibis (Plegadis chihi)
Listing: CDFG Species of Special Concern

The white-faced ibis was formerly much more common in all areas during all seasons but is now found primarily at the Salton Sea. Extensive marshes are required for nesting. Foraging birds may be found in flooded fields, marshes, ditches, and occasionally in estuaries. This species is not known to breed regularly anywhere in California, however, riparian areas and marshes along the Salton Sea have been used for breeding.

Several white-faced ibis were observed foraging adjacent to the project limits in irrigated agricultural fields. The project is not expected to impact white-faced ibis breeding areas. All agricultural fields and drains are considered potential foraging habitat.

Great blue heron (Ardea herodias)
Listing: Rookery site CDFG Special Animal

The great blue heron is found in a variety of aquatic habitats including, fresh and brackish marshes, tidal flats and along lakes, rivers, and irrigation ditches. This species is found throughout most of North America and winters to northern South America. In Imperial County, they are a fairly common localized breeding resident in winter, and a common migrant in the spring, summer and fall. Within Imperial County, the great blue heron has been observed from the Salton Sea shoreline and the irrigation canals throughout the county.

Several individuals of this species were observed using the irrigation ditches, canals and drains within the project limits. The project is not expected to impact the great blue heron breeding areas. All agricultural fields and drains are considered potential foraging habitat.

Great egret (Casmerodius albus)
Listing: Rookery Site CDFG Special Animal

The great egret occurs in a variety of aquatic habitats including lagoon, bays, and estuaries along the coast; and ponds and lakes at inland locations. This species occurs from the northern U.S. to the Straits of Magellan, and in the warmer parts of Europe. Great egrets breed locally from southern Oregon to California and Arizona.

Several individuals of this species were observed using the irrigation ditches, canals and drains within the project limits. The project is not expected to impact the great egret breeding areas. All agricultural fields and drains are considered potential foraging habitat.

Loggerhead shrike (Lanius ludovicianus)
Listing: CDFG Species of Special Concern

In the desert area, loggerhead shrikes can be found in agricultural land, washes and desert edge scrub. This species requires expanses of open ground for foraging as well as, posts, wires, trees on scrubs for perching. One individual of this species was seen during protocol surveys. Potential habitat exists in many portions of the area, but the project is unlikely to affect this species if nesting sites are identified within construction limits.

Yellow warbler (Dendroica petechia brewsteri)
Listing: CDFG Species of Special Concern

The yellow warbler can be found in riparian habitats, open woodlands, and orchards however, breeding is restricted to riparian woodlands. The yellow warbler is a fairly common spring migrant, uncommon and localized summer resident, fairly common fall migrant and a rare winter visitor. The decline in population size is due in part to nest parasitism of the brown-headed cowbird.

Yellow warblers were observed foraging in quail bush on the flats above the New River 100-year Floodplain within the Fredricks Alternative project limits.

Species identified by the USFWS that may occur in the project vicinity

Desert pupfish (Cyprinodon macularis)
Listing: Federal Endangered, State Endangered

The desert pupfish was once widespread and abundant in portions of southeastern California, southern Arizona and northern Mexico. Desert pupfish prefer areas with a sand–silt substrate with either rooted or unattached aquatic plants, algae growth and very restricted surface flow. Although desert pupfish are capable of surviving extreme environmental conditions, they cannot tolerate competition or predation by exotic fish species. The species is threatened with extinction throughout its native range primarily because of competition and predation by exotic fish species, loss and alteration of habitat and pollution. Current distribution in California is limited to San Felipe and Salt Creeks, shoreline pools of the Salton Sea, agricultural drains leading to the Salton Sea and several refugia ponds.

All of the drains impacted by the project empty into the New River and therefore, do not flow directly into the Salton Sea. The New River, with its deep, fast moving water and steep abrupt banks is not considered appropriate for the desert pupfish. Only agricultural drains with a direct

connection to Salton Sea have the potential to be occupied by pupfish. The desert pupfish is not expected to occur within any of the aquatic habitats on site.

Peregrine falcon (Falco peregrinus)
Listing: State Endangered

Peregrines historically ranged throughout most of North America. The peregrine was nearly extinct in the United States by the mid-1970s. Presently, peregrines nest from the tree line in Alaska and Canada to Mexico. The northern migrant populations winter in South America. Peregrine falcons nest on cliffs (preferred sites are sheer cliffs 150 feet or more in height), often near water, and feed on a variety of birds. Breeding territories of the peregrine falcon are usually near a lake, river or marsh.

This species is an occasional visitor to the Imperial Valley and no suitable nesting habitat exists within the project area. There are no records of this species in the quadrangles searched, and no individuals were observed during project surveys.

Least Bell's vireo (Vireo bellii pusillus)
Listing: Federal and State Endangered

The species is a migratory songbird that winters in southern Baja California and breeds in Southern California and northwestern Baja California. Its breeding range is restricted to primarily dense riparian vegetation, southern willow scrub, dominated by willow, with lush understory vegetation.

The least bell’s vireo is not considered a typical species within the fauna of Imperial Valley. It may be a rare migrant or an occasional winter visitor. The San Diego Natural History Museum has one record of a least bell’s vireo in the Brawley area between November 10, and December 20, 1986. There are no records of this species in the quadrangles searched, and no individuals were observed during project surveys.

Brown pelican (Pelecanus occidentalis)
Listing: Federal and State Endangered

The brown pelican inhabits the Atlantic, Pacific, and Gulf Coasts of North and South America. With the advent and widespread use of pesticides such as DDT in the 1940s, pelican populations plummeted due to lack of breeding success. The brown pelican was the first species to recover from the effects of pesticides.

The brown pelican is a post breeding visitor to the area and is restricted to the open water of the Salton Sea and larger lakes in the Imperial Valley. This species was not observed during project surveys and is not expected to occur within the project limits.

Mountain plover (Charadrius montanus)
Listing: Federal Proposed Threatened and CDFG Species of Special Concern

The mountain plover is a small, mostly brown and white bird that prefers to nest on shortgrass prairie or even bare ground. Breeding occurs in the Rocky Mountain States from Canada south

to Mexico with most breeding occurring in Montana and Colorado. Most wintering birds occur in California where they are found on grasslands or landscapes resembling grasslands, and cultivated fields; many fewer wintering plovers are reported from Arizona, Texas and Mexico (Department of the Interior 1999).

The mountain plover's natural range has been reduced by more than 50 % and its numbers by approximately 93 %. Hazards facing the bird include toxic agricultural chemicals on both its nesting and wintering grounds, oil and gas drilling, some range management practices, and predators.

The mountain plover is a common winter visitor in the Imperial Valley. These birds spend about 75 % of their time on plowed fields, burned grasslands, heavily grazed annual grasslands and/or burned fields. Mountain plovers begin to arrive on wintering grounds in the Imperial Valley by September, but do not appear in large numbers until November. They begin leaving wintering areas by mid-March and may make a non-stop migration to breeding grounds. On wintering grounds, plovers tend to roost in loosely spaced flocks at sites where birds foraged that day or evening (Knopf and Rupert 1995).

Approximately 115 mountain plovers were observed foraging in a bare dirt field north of the Del Rio and Del Rio North Alternatives just east of the proposed SR-78/86 intersection during surveys conducted in November of 1999 (Figure 3-1M). This field will not be impacted by the project. In addition, approximately 137 mountain plovers were observed foraging in a field of emergent alfalfa west of SR-111 just before the Del Rio and Del Rio North Alternatives merge just east of the proposed SR-78/86 intersection during surveys conducted in December of 1999 (Figure 3-1H). The field is approximately 69 ha (168 acres) in size. The Del Rio Alternative would impact 9.0 ha (22 acres) of this field and the Del Rio North Alternative would impact 4.0 ha (9.9 acres). No mountain plovers were observed on the Fredricks Alternative surveys.

Approximately 135 ha (333 acres) of farmland would be impacted by each alternative. All agricultural land within the project limits is considered potential foraging habitat for the mountain plover. Plovers were identified in only small percentage of the agricultural fields within the project. There is still a large amount of foraging habitat (agricultural fields) available to the mountain plover adjacent to project and within the Imperial Valley. Approximately 207,265 ha (512,163 acres) of the counties total land area is devoted to irrigated agriculture. Potential impacts from this project should be minimal. Specific mitigation for impacts to plover wintering habitat is currently being coordinated with the USFWS.

3.6 VISUAL QUALITY

The landscape of the region is comprised of flat topography, expansive views of the surrounding mountains, agricultural land uses and a rectilinear north-south grid pattern of roads and fields. The low frequency of structures and trees emphasizes their presence in the vast, open landscape. Their vertical forms serve as orientation points in the horizontal plane of the valley. The rectilinear agricultural fields with their precise row crops and canal systems are permanent forms in the landscape (see Figure 3-1A).

The visual quality of the region is moderate and is evaluated according to three criteria: vividness, intactness and unity. These evaluation criteria are discussed and defined in the Visual

Impact Assessment for the SR-78/111 expressway project. The lack of vivid visual elements in the landscape prevents the high degree of unity and intactness to result in a higher overall visual quality. Further evaluation of specific areas within the viewshed potentially effected by the proposed project is discussed in detail in Section 4-8.

The existing viewer groups within the project study area include residents, commercial/industrial employees, agricultural workers, motorists and golf course employees and patrons.

3.7 NOISE

The noise levels reported in this analysis are measured in terms of decibel units on the "A" scale of a sound level meter, and are abbreviated "dBA." The "A" weighted decibel scale on the sound meter is used because it closely parallels the human hearing response. The noise level descriptor used in this report is the Hourly Equivalent Noise Level. The Leq(h) is formulated in terms of the equivalent steady state noise level, which in a one-hour period of time contains the same acoustical energy as time-varying sound level for that same hour. Noise level increases or decreases must be viewed in their proper perspective. The average human ear cannot detect a change in noise level of one decibel. A two or three decibel change is barely detectable, but a five-decibel change is very noticeable. A 10 decibel change will double the perceived noise level. Table 4-5 shows the relative loudness of various types of construction equipment and study describes the relative loudness of common indoor and outdoor devices and situations for a comparative reference.

Traffic and farming activities on SR-78, SR-86 and SR-111 are the predominant sources of noise in the project area. The predicted traffic volumes are based in part on historical traffic trends and preliminary data from the Imperial County Transportation Model. The traffic analysis is discussed in Chapter 1. The traffic volumes on local roads are growing, and are the main contributors to traffic noise in the city of Brawley. To determine the existing noise levels in the project area noise measurements were taken at thirteen representative receptor locations during the noisiest traffic hours (Receptors 1a, 1b, 2, 3, 6, 8, 10,12,16, 17, 18, 19 and 22). (see Figure 3-16).
A total of twenty-four receptor locations were selected to evaluate the three alternatives (Twenty-two residential receptors and two receptors on the Del Rio Golf Course). The receptors were selected because they were either the closest to the proposed project site, or would have the most exposure to traffic noise in their respective area of the project. Four residential sites (Sites 16, 17, 18 and 19) were selected to analyze future traffic noise levels for the no project alternative.

The existing noise measurements ranged from hourly Leq's of 48dBA to 68 dBA. The receptors located along SR-78 within the project area have the highest existing noise levels. Detailed discussion on the criteria and methodologies used for the noise analysis are provided in Section 4.9, and in the "Traffic Noise Study for Brawley Bypass" - January 1999.

Methodology (Existing Noise Levels)

The existing noise levels were measured using the FHWA approved method for sampling noise. This methodology was taken from the FHWA Highway Noise Manual, "Sound Procedures for Measuring Highway Noise: Final Report, FHWA-DP-45-1R, August 1981". Metrosonics db-

308 Sound Level Monitors were used to sample the existing noise levels. The db-308 is a Type 2 Instrument as defined in the American National Standard Institute (ANSI) specification S1.4-1984. The instruments were calibrated with a Metrosonics Model CL304 Acoustical Calibrator before and after the tests to insure that the readings were correct. All of the District 11 noise equipment (Calibrators, Microphones, Sound Level Meters) are checked and calibrated once each year by the manufacturer. The accuracy of the testing equipment used by the manufacturer is defined annually by the National Bureau of Standards.

Noise Abatement Criteria

The Traffic Noise Analysis Protocol (October, 1998) used in this analysis contains Caltrans noise policies, which fulfill the highway noise analysis and abatement/mitigation requirements stemming from the following State and Federal environmental statutes:

- California Environmental Quality Act (CEQA)
- National Environmental Policy Act (NEPA)
- Title 23 United States Code of Federal Regulations, Part 772 “Procedures for Abatement of Highway Traffic Noise and Construction Noise” (23 CFR 772)
- Section 216 of the California Streets and Highways Code

Noise Abatement Criteria was established by FHWA for various activities and land uses. A Noise Abatement Criterion of 67 dBA is given for Category "B" Receptors (Exterior Noise Levels), such as residential housing, where frequent human use occurs and a lowered noise level would be of benefit. A Noise Abatement Criterion of 52 dBA is given for Category "E" Receptors (Interior Noise Levels). These are receptors where interior noise levels are of importance, such as school classrooms, libraries or hospitals (see Table 3-4 for category definitions and noise abatement criteria).

Table 3 - 4

Noise Abatement Criteria[1]

Activity Category	Leq(h)	L_{10}(h)	Description of Activity Category
A	57 (Exterior)	60 (Exterior)	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B	67 (Exterior)	70 (Exterior)	Parks, residences, motels, hotels, schools, churches, libraries, and hospitals.
C	72 (Exterior)	75 (Exterior)	Developed lands, properties, or activities not included in Categories A or B above.
D	—	—	Undeveloped lands.
E	52 (Interior)	55 (Interior)	Residences, motels, hotels, public meeting rooms, schools Churches, libraries, hospitals, and auditoriums.

[1]Hourly A-Weighted Sound Level – Decibels (dBA), Federal-Aid Highway Program Manual Vol.7, Chapter 7 Transmittal 348, August 9, 1982 Sec. 3, Attachment.

3.8 AIR QUALITY

The Imperial Valley is located within the Salton Sea Air Basin. This basin, originally part of the Southeast Desert Air Basin, encompasses all of Imperial County. Air quality in Imperial County is affected by emissions from a variety of sources. Those sources include industrial and manufacturing plants located upwind from the County, regional and local vehicular emissions, which include medium and heavy trucks crossing the border to and from Mexico, and agricultural operations, which generate dust from disturbed soils and which include crop-dusting during pesticide application.

The US Environmental Protection Agency (EPA) lists air pollutant compounds that may endanger public health or welfare. EPA also identifies National Ambient Air Quality Standards (national standards) protective of public health and welfare. Currently, the EPA has established national standards for ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, particulate matter (PM-10 PM-2.5), and lead. These compounds are referred to as "criteria air pollutants." California has adopted more stringent standards for most of the criteria air pollutants (referred to as State Ambient Air Quality Standards, or state standards) and has adopted ambient air quality standards for some pollutants for which there are no corresponding federal standards.

Ozone

Ozone is not emitted directly into the atmosphere, but is a secondary air pollutant produced in the atmosphere through a series of photochemical reactions involving volatile organic compounds (VOC) and nitrogen oxides (Nox). VOC and Nox are known as precursor compounds for ozone. Significant ozone production generally requires ozone precursor presence for approximately three hours in a stable atmosphere with strong sunlight. Ozone is a regional air pollutant because its precursors are transported and diffused by wind concurrently with ozone production.

Short-term exposure to elevated concentrations of ozone is linked to health effects such as eye irritation and breathing difficulties. Ozone may pose its worst health threat to those who already suffer from respiratory diseases. Besides human health effects, long term exposure to ozone concentrations above 0.6 ppm are known to affect plant physiology in leaf crops and grapes. Violations of the state ozone standards have occurred on an average of approximately 31 days per year over the last five years. On-road motor vehicle traffic contributes approximately 35% and 38% to Imperial County's inventory of reactive organic gases and Nox, respectively. In Imperial County however, some ozone levels in excess of the state standard can be traced to emissions of ozone precursors transported by wind from the South Coast Air Basin from Mexico.

Carbon Monoxide

Ambient carbon monoxide concentrations normally are considered a local effect and typically closely correspond to the spatial and temporal distributions of vehicular traffic. Wind speed and atmospheric mixing also influence carbon monoxide concentrations. Under inversion conditions, carbon monoxide concentrations may be distributed more uniformly over an area out to some distance from vehicular sources.

When inhaled at high concentrations, carbon monoxide combines with hemoglobin in the blood and reduces the oxygen-carrying capacity of the blood. This results in reduced oxygen reaching the brain, heart, and other body tissues. This condition is especially critical for people with cardiovascular diseases, chronic lung disease, or anemia, as well as for fetuses. On-road motor vehicles account for approximately 58% of the regional inventory for carbon monoxide.

Particulate Matter (PM-10 and PM-2.5)

Particulate matter includes both liquid and solid particles of a wide range of sizes and composition. Of particular concern are those particles smaller than or equal to ten microns in size (PM_{10}) and smaller than or equal to 2.5 microns in size ($PM_{2.5}$). Combustion sources like vehicles, diesel engines, industrial facilities, and agriculture operations produce the emissions that react to form the fine particulate matter. Some of these operations, such as demolition and construction activities, contribute to local particulate matter concentrations, while others, such as vehicular traffic, affect regional particulate matter concentrations. These particles can remain suspended in the air for long periods and can travel a great distance. The principal health effect of airborne particulate matter is on the respiratory system.

High concentrations of PM-10 in many areas in Imperial County result from local direct PM-10 emissions. One of the emissions inventories, conducted by the Air Resources Board, indicated the major local source of direct PM-10 emissions is wind action. The wind picks up particles from disturbed and undisturbed surfaces, non-commercial travel on paved and unpaved roadways, construction and demolition activities, and farming operations, such as crop burning.

At the regional scale, this project is included in the approved RTP and Transportation Improvement Program (TIP). Regional PM_{10} SIP budget compliance was accounted for during the RTP and TIP conformity determinations. Projects are only subject to hot spot analysis for PM_{10} if they are located in a PM_{10} non-attainment or maintenance area (federal standards), for purposes of Transportation Conformity. Imperial County is in a PM_{10} nonattainment area for both state and federal standards.

PM-10 SIP Attainment Plan

There are no intersections or other transportation facilities identified in the Imperial County PM-10 SIP as having monitored PM-10 violations.

Requirement for PM-10 "Hot Spot" Analysis

The purpose of the analysis is to demonstrate that the project would not cause or contribute to any new localized PM-10 violations or increase the frequency or severity of any existing PM-10 violations. A PM-10 "Hot Spot" analysis is not required for construction activities that cause temporary increase in emissions, per 40 CFR 93.123 (c) (5).

Attainment/Non-Attainment Designations

Under amendments to the federal Clean Air Act, the EPA has classified Air Basins, or portions thereof, as either “attainment” or “non-attainment” for each criteria air pollutant, based on whether or not the national standards have been achieved. The State has similar requirements for

"attainment" or "non-attainment," but with respect to the state standards, rather than the national standards described above. The project site lies within the Salton Sea Air Basin. The air basin, or portions thereof, is "non-attainment" for state and national standards for ozone and PM-10, and the city of Brawley is in "attainment" for state carbon monoxide standard. The basin is "attainment" for state and national standards for nitrogen dioxide and sulfur dioxide. State and national standards for criteria pollutants are provided in Appendix F.

The proposed project is included in the Southern California Association of Governments (SCAG) 2000/2001-2005/2006 Regional Transportation Improvement Program (RTIP). The Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA) made a conformity determination on the SCAG RTIP on October 6, 2000 and the Regional Transportation Plan (RTP) on June 8, 1998. The design concept and scope of the proposed project has not changed from what is included in the RTIP and RTP and therefore the proposed project comes from a conforming transportation plan and program. SCAG will need to have a new conformity finding by June 8, 2001. The regional emission analyses for Imperial County are based on the build/no-build test for both PM_{10} and ozone. The design concept and scope of the proposed project has not changed from what is included in the RTIP and RTP and therefore the proposed project comes from a conforming transportation plan and program.

3.9 HYDROLOGIC AND WATER QUALITY SETTING

This section provides background hydrology and water quality data on both surface and groundwater locations within the project area.

Surface Water Hydrology

All of the proposed build alternatives are located within the Colorado River Basin. Waters of the United States located within the Colorado River Basin and the vicinity of the project include the New River and the Salton Sea. Additional waters located within or near of the vicinity of the project are the Main distribution canals of the Imperial Irrigation District (IID), the Westside Main Canal, and the Central Main Canal. The New River flows into the Salton Sea. All of the identified surface water bodies flow northward and are shown in Figure 3-2.

The Water element of the Imperial County General Plan provides goals, objectives and policies to guide the development, utilization, and preservation of water resources in the County. Because of their dependence on the Colorado River and the uses to which water is applied, the Imperial Valley above-ground water resources are different than what would be expected in a natural desert.

These above-ground water resources fall into three categories: freshwater, brackish water and saline water. The freshwater (TDS < 1000 ppm) resources include the canal and lateral system operated by Imperial Irrigation District and a few natural creeks such as the San Felipe Creek that descend from the mountains. The brackish waters (2000 < TDS < 4000 ppm) include the New River, the Alamo River and agricultural drains that flow either into these two rivers or directly into the Salton Sea. The saline above-ground water resource is the Salton Sea. A 300% to 500% increase in total dissolved solids is normal within the valley as water moves from the All-American Canal to the New and Alamo Rivers.

New River

The New River flows north across the U.S./Mexican international border, through the project area and into the Salton Sea. The flow into the Salton Sea averages an annual rate of approximately 600 cubic feet per second (U.S. Geologic Survey 1995). In Mexico, sewage and industrial waste are discharged in to the New River. The New River is also subject to storm and agriculture runoff. As a result of these discharges, and according to Section 13050 of the California Water Code, the New River is considered polluted.

Imperial Irrigation District (IID) Distribution Lines

The IID distribution lines work to convey supply water from the Colorado River to various locations within the project area (see Figure 3-2). The supply water is mainly used for agriculture and domestic purposes. The delivery canals and their laterals are all concrete lined, except for the Westside Main Canal, and are actively maintained to eliminate vegetation. The agricultural drains are artificially created to drain upland areas to natural watercourses. The drains are unlined, but are maintained and generally devoid of vegetation. The majority of the canals and drains impacted by the project alternatives are perpendicular to the proposed Alternative and will be piped under the new highway.

Salton Sea

The area of the Salton Sea is about 6.7 million hectares (16,555,990 acres) and the depth is an average of 9 meters (30 feet). The New and Alamo Rivers, and the Westside Main Canal flow northward into the southern portion of the Salton Sea.

Ground Water Hydrology and Hydro-Geology

Ground Water in the vicinity of the project is located within the Imperial Valley Hydraulic Unit and generally flows northwest to the Salton Sea. The depth to the ground water ranges between 1.5 to 9.1 meters (5 to 30 feet) below ground.

The soil material within the project area generally consists of clayey lake deposits, which inhibit water movement in the unsaturated and saturated zones. In the past, agriculture tile drain systems were installed to promote movement of irrigation water into the unsaturated zone to dewater sediments that became saturated with irrigation water containing pesticides, herbicides, and salts. The purpose of dewatering is to remove the accumulated agriculture chemicals from the root zone.

There are several recharge sources for ground water in the vicinity of the project. Recharge of ground water may occur from influent surface waters (i.e., water flow from surface water to ground water), irrigation water and infiltration from precipitation events that are not captured by the tile drain system.

Water Quality and Beneficial Uses

The Water Quality Control Plan for the Colorado River Basin (RWQCB 1994 Basin Plan) identifies the beneficial uses and water quality objectives of surface waters and ground water in

the Colorado River Basin. The Basin Plan includes both narrative and numerical water quality objectives to protect the beneficial uses. The water quality objectives for surface waters and ground waters in the Colorado River Basin are presented in the Biological Resource Report.

IID System the Westside Main Canal and Central Main Canal

The IID canals and laterals convey supply water from the Colorado River. The quality of Colorado River water has been determined to be suitable for both municipal and agricultural uses, and meets water quality objectives.

New River

Some of the identified constituents that have been discharged into the New River are human wastes, industrial wastes, pesticides, and fertilizers. These discharges have resulted in elevated levels of TDS (total dissolved solids), fecal coliform, total coliform, e.coli and unidentified, specific industrial compounds. The industrial compounds have not been fully investigated because information regarding discharges in Mexico is not available.

Salton Sea

The Salton Sea receives drainage wastewater from the New and Alamo Rivers, and the Westside Main Canal. Constituents described above would flow into the Salton Sea.

Ground Water

The thick, saturated lacustrine and playa deposits which underlie the project area appear to have zones of low vertical permeability. This results in large variations in water quality with depth. The groundwater quality in the shallow layers near the root zone is generally considered poorer than in the deeper zones because of accumulated pesticides, herbicides, and salts originating from irrigation. The groundwater throughout the Imperial Valley Hydrologic Unit is generally considered poor, and unusable for municipal and agricultural purposes.

3.10 FLOODPLAIN

The New River 100-year Floodplain is located in the western portion of the Colorado basin in the Imperial Valley (see Figure 3-19). It flows through the project study area and must be crossed by all alternatives. The river has a narrow channel that meanders through a large, steep banked channel in the valley floor. Within the large channel in the project vicinity are a series of agricultural fields, undeveloped open space, drains, access roads, the Brawley Sewage Treatment Plant, and a landfill located upstream from the Fredricks Alternative. The city has designated the river area as open space. The 100-year Floodplain is located within the large channel but does not fill it in most locations. The water from this river is not used in the Imperial Valley but the river channels are used to carry irrigation drainage from the fields through the Imperial Valley to the Salton Sea. Natural and beneficial floodplain values include sustaining aquatic habitat for fish and wildlife, and esthetic enjoyment.

3.11 GEOLOGY, SOILS, AND SEISMICITY

The Imperial Valley is the most seismically active area in the contiguous United States (see Figure 3-18). The central portion of the Imperial Valley is a spreading center along the San Andreas Rift. Numerous faults comprise a rift within the valley, with frequent damaging earthquakes. Active traces of the Imperial Fault and the Brawley Fault exist to the south of the proposed project area. Current knowledge on the northern extent of these faults was only acquired as recently as 1979 following the Imperial Valley earthquake. These faults may extend to the northwest in a trend across the proposed project alternatives. Once a project alternative has been selected, a detailed field study will be needed to determine if these faults exist and their corresponding extension and location. Detailed field study will be necessary at the proposed bridge sites of the New River crossing and the Union Pacific Railroad crossing.

Surface and near surface soils in the project area consist predominantly of clay and silt deposits from the ancient Lake Cahuilla. Lake Cahuilla was in existence as recently as several hundred years ago. The clay and silt deposits are believed to be less than 30 meters (98 feet) thick. These soils are well-drained lake sediment (lacustrine) deposits and alluvial (stream) deposits of loose to medium-dense silty sand, sandy silt and soft to stiff fat clays disturbed by agricultural activities. These soils are excellent for agricultural production, but the same characteristics that make prime farmland also make the soils susceptible to liquefaction, especially in areas where the groundwater table is shallow. Groundwater is likely to be encountered between 1.5 to 9.1 meters (5 to 30 feet) below the ground surface.

Liquefaction is a phenomenon that has been observed in loose, saturated sandy soils. The liquefaction potential along the proposed highway is directly related to the size and duration of the seismic event, the depth of the groundwater, the soil type and the degree of soil consolidation. Specific testing and analysis for liquefaction potential was not conducted at this stage of the project. Such testing would be appropriately conducted after selection of the project alternative.

3.12 HISTORIC AND CULTURAL RESOURCES

No buildings or structures identified along the project alternatives are eligible for the National Register of Historic Places (NRHP) under any criteria established in the Code of Federal Regulations. Refer to Appendix E for a copy of a concurrence letter from the State Historic Preservation Office (SHPO). No known archaeological resources occur along any of the project alternatives.

3.13 HAZARDOUS WASTE

A general field review and specific studies were conducted for the evaluation of documented and observed hazardous materials sites. To research known hazardous waste locations in the study area a Vista Search of hazardous waste geographic databases was completed. Other databases used were the Cortese List (Hazardous Waste Substance Site List) and the LUST (Leaking Underground Storage Tanks) databases provided by California Environmental Protection Agency (Cal EPA).

These searches turned up two potentially hazardous waste sites on the Fredricks Alternative, while the other two alternatives did not contain any. However, all of the sites traverse over the polluted New River, which may present some environmental health concerns for workers during construction and maintenance.

An evaluation of aerial deposited lead has shown that it is not a concern in the study area. Examination for aerial deposited lead is only performed at locations where average daily traffic volumes exceed 50,000, per Caltrans Hazardous Management. No roads in the area currently carry this volume of traffic.